

WHAT IS CLAIMED IS:

1. A method for fabricating a semiconductor device, comprising the steps of:

crystallizing a semiconductor film comprising amorphous silicon;

forming a gate insulating film on said semiconductor film;
forming a gate electrode on said gate insulating film, said gate electrode having tapered side edges; and

forming source and drain regions in said semiconductor film by ion doping.

2. A method according to claim 1 wherein said crystallizing said semiconductor film is performed by a laser irradiating.

3. A method according to claim 1 wherein said source and drain regions are formed by said ion doping with at least one of phosphorus and boron.

4. A method according to claim 1 wherein said forming said gate electrode is performed by a wet etching.

5. A method according to claim 1 wherein said semiconductor film comprising amorphous silicon has a thickness of 50 to 150 nm.

6. A method for fabricating a semiconductor device, comprising the steps of:

forming a semiconductor film comprising amorphous silicon on an insulating surface;

introducing boron into at least a portion of said semiconductor film, said portion being to become at least a channel region;

5 crystallizing said semiconductor film;

forming a gate insulating film on said semiconductor film;

forming a gate electrode on said gate insulating film; and

forming source and drain regions in said semiconductor film by ion doping.

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7. A method according to claim 6 wherein said channel region is substantially intrinsic type or n-type.

8. A method according to claim 6 wherein said crystallizing said semiconductor film is performed by a laser irradiating.

15 9. A method according to claim 6 wherein said source and drain regions are formed by said ion doping with at least one of phosphorus and boron.

10. A method according to claim 6 wherein said forming said gate electrode is performed by a wet etching.

20 11. A method according to claim 6 wherein said semiconductor film comprising amorphous silicon has a thickness of 50 to 150 nm.

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12. A method for fabricating a semiconductor device, comprising the steps of:

forming a semiconductor film comprising amorphous silicon
on an insulating surface;

introducing boron into at least a portion of said semiconductor
film, said portion being to become at least a channel region;

5 crystallizing said semiconductor film;

forming a gate insulating film on said semiconductor film;

forming a gate electrode on said gate insulating film, said gate
electrode having tapered side edges; and

forming source and drain regions in said semiconductor film
10 by ion doping.

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13. A method according to claim 12 wherein said channel region
is substantially ~~intrinsic~~ type or n-type.

14. A method according to claim 12 wherein said crystallizing
said semiconductor film is performed by a laser irradiating.

15 15. A method according to claim 12 wherein said source and drain
regions are formed by said ion doping with at least one of phosphorus and
boron.

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16. A method according to claim 12 wherein said forming said
gate electrode is performed by a wet etching.

20 17. A method according to claim 12 wherein said semiconductor
film comprising amorphous silicon has a thickness of 50 to 150 nm.

18. A method for fabricating a semiconductor device, comprising the steps of:

forming a semiconductor film comprising amorphous silicon on an insulating surface;

introducing boron into at least a portion of said semiconductor film, said portion being to become at least a channel region;

crystallizing said semiconductor film; and

forming source and drain regions in said semiconductor film by ion doping.

19. A method according to claim 18 wherein said channel region is substantially intrinsic type or n-type.

20. A method according to claim 18 wherein said crystallizing said semiconductor film is performed by a laser irradiating.

21. A method according to claim 18 wherein said source and drain regions are formed by said ion doping with at least one of phosphorus and boron.

22. A method according to claim 18 wherein said semiconductor film comprising amorphous silicon has a thickness of 50 to 150 nm.

23. A method for fabricating a semiconductor device, comprising the steps of:

forming a semiconductor film comprising amorphous silicon on an insulating surface;

introducing boron into at least a portion of said semiconductor film, said portion being to become at least a channel region;
crystallizing said semiconductor film;
forming a gate insulating film on said semiconductor film;
5 forming a gate electrode on said gate insulating film; and
forming source and drain regions in said semiconductor film by ion doping which is performed through said gate insulating film.

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24. A method according to claim 23 wherein said channel region is substantially intrinsic type or n-type.

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25. A method according to claim 23 wherein said crystallizing said semiconductor film is performed by a laser irradiating.

26. A method according to claim 23 wherein said source and drain regions are formed by said ion doping with at least one of phosphorus and boron.

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27. A method according to claim 23 wherein said forming said gate electrode is performed by a wet etching.

28. A method according to claim 23 wherein said semiconductor film comprising amorphous silicon has a thickness of 50 to 150 nm.

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29. A method for fabricating a semiconductor device, comprising the steps of:
forming a semiconductor film comprising amorphous silicon on an insulating surface;

introducing boron into at least a portion of said semiconductor film, said portion being to become at least a channel region;

crystallizing said semiconductor film by laser irradiation;

forming a gate insulating film on said semiconductor film;

5 forming a gate electrode on said gate insulating film; and

forming source and drain regions in said semiconductor film by ion doping.

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30. A method according to claim 29 wherein said channel region is substantially intrinsic type or n-type.

10 31. A method according to claim 29 wherein said source and drain regions are formed by said ion doping with at least one of phosphorus and boron.

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32. A method according to claim 29 wherein said forming said gate electrode is performed by a wet etching.

15 33. A method according to claim 29 wherein said semiconductor film comprising amorphous silicon has a thickness of 50 to 150 nm.

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